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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,416	03/18/2005	Seiji Kawaguchi	265135US2PCT	4456

22850 7590 05/14/2009

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EXAMINER	
CHOWDHURY, AFROZA Y	
ART UNIT	**PAPER NUMBER**
2629	

NOTIFICATION DATE	DELIVERY MODE
05/14/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/528,416	KAWAGUCHI ET AL.	
	Examiner	Art Unit	
	AFROZA Y. CHOWDHURY	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6,8-15 and 17-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6,8-15 and 17-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/23/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's request for continued examination (RCE) filed on **April 23, 2009** has been entered. Claims 1, 3, 4, 6, 8-15, and 17-30 are currently pending. Applicant's amended claim and argument addressed herein below.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3, 4, 6, 8, 20-22, 24-26, 28, and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 3, 4, 6, 8, 20-22, 24-26, 28, and 30, **"OCB mode"** is not clear. OCB is abbreviated for what?

Regarding claims 30, **"OCM mode"** is not clear. OCM abbreviated for what is not understood.

Regarding claims 1 and 30, "**when an off signal is output…… the driver applies a voltage equal to or higher than a critical voltage……. thereafter the**

driver applies a voltage lower than the critical voltage…….. and thereafter supplying of power to the driver from the liquid crystal driving power supply is stopped" is not clear. How a voltage is applied when an off signal is output is not understood. What is an "**off signal**"? When the driver applies a voltage equal to or higher than a critical voltage of OCB mode liquid crystal, the liquid crystal layer transfers to what orientation? Is it in bending orientation/ alignment state?

Claims 3, 4, 6, 8, 23, and 24 are also rejected the same as claims 1 and 30 above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 17-19, and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hattori et al.** (US Pub. 2001/0020925) in view of **Shi et al.** (US Pub. 2003/0053017).

As to claim 1, Hattori et al. discloses a liquid crystal display apparatus comprising:

a liquid crystal layer (figs. 3, 7A(7)) using OCB mode liquid crystal ([0070], [0085]);

a driver (fig. 3(12,13)) applying a voltage to the liquid crystal layer ([0086]);

a liquid-crystal driving power supply supplying power to the driver ([0093]);

a switch (fig. 3(15)) outputting an on/off signal to the driver ([0088]); and

when an off signal (voltage pulse, [0087]) is output from the switch, the driver (fig. 3(12,13)) applies a predetermined voltage which can be applied to each of pixels of the liquid crystal layer for a predetermined time ([0087] – [0088]), thereafter the driver applies a voltage lower than the predetermine voltage, thereafter supplying of power to the driver from the liquid-crystal driving power supply is stopped (figs. 2, 3, [0086] – [0089], [0103]).

Hattori et al. does not specifically teach whether the predetermined voltage is a voltage equal to or higher than a critical voltage of OCB mode liquid crystal and when the driver applies a voltage lower than the critical voltage of the OCB mode liquid crystal for a predetermined time in order to transfer the liquid crystal layer to a splay orientation.

Shi et al. teaches a critical voltage above which the liquid crystal layer stays in a bending alignment state and below which it stays in a splay orientation ([0008]).

Therefore it would have been obvious to one skill in the art at the time of the invention was made to incorporate the idea of Shi et al. of using a critical voltage to modify the display device of Hattori et al. to make a display where a voltage is applied that is equal to or higher than a critical voltage of OCB mode liquid crystal for a

predetermined time and thereafter a voltage lower than the critical voltage of the OCB mode liquid crystal for a predetermined time in order to transfer the liquid crystal layer to a splay orientation in order to complete faster transition between splay and bend orientation to reduce afterimage (as best understood).

As to claim 17, Hattori et al. teaches a liquid crystal display apparatus wherein the voltage to be applied to each of pixels is an alternating voltage ([0046], [0087]).

As to claims 18 and 19, Hattori et al. teaches a liquid crystal display apparatus wherein the predetermined voltage is a uniform voltage for each of the pixels ([0046], [0087]).

As to claim 28, Hattori et al. discloses a liquid crystal display apparatus comprising:

a pixel electrode to which an individual pixel voltage is applied with respect to each pixel ([0086] – [0089]) and an opposed electrode arranged opposite to the pixel electrodes are disposed on the liquid crystal layer (figs. 3, 5, [0109]), and

a non-voltage region having no voltage applied to the opposed electrode is formed for each pixel in a region adjacent to a region where the pixel electrode and the opposed electrode are opposed to each other in the liquid crystal layer (figs. 5, 7, [0109]).

Hattori et al. does not specifically teach a size of the non-voltage region is such that even if the liquid crystal layer becomes bend orientation, at least a part of the region can maintain splay orientation.

However, it is obvious to make a liquid crystal display apparatus with a size of the non-voltage region is such that even if the liquid crystal layer becomes bend orientation, at least a part of the region can maintain splay orientation for certain application ([0092]) (as best understood).

As to claim 29, it is a design choice to make a liquid crystal display apparatus wherein a size of the non-voltage region is 400μm^2 or more (as best understood).

As to claim 30, Hattori et al. teaches a liquid-crystal-display stopping method comprising:

inputting an OFF signal (voltage pulse, [0087]) to a driver (fig. 3(12,13)) of applying a voltage to a liquid crystal layer using OCM mode liquid crystal (fig. 3);

applying a predetermined voltage which can be applied to each of pixels of the liquid crystal layer for a predetermined time ([0087] – [0088]), thereafter applying a voltage lower than the predetermine voltage when the OFF signal is input ([0087] – [0088]); and

stopping supply of power to the driver from a liquid crystal driving source supplying power to the driver after the predetermined period elapses (fig. 2, [0086] – [0089], [0103]).

Hattori et al. does not specifically teach whether the predetermined voltage is a voltage equal to or higher than a critical voltage of OCB mode liquid crystal and when the driver applies a voltage lower than the critical voltage of the OCB mode liquid crystal for a predetermined time in order to transfer the liquid crystal layer to a splay orientation.

Shi et al. teaches a critical voltage above which the liquid crystal layer stays in a bending alignment state and below which it stays in a splay orientation ([0008]).

Therefore it would have been obvious to one skill in the art at the time of the invention was made to incorporate the idea of Shi et al. of using a critical voltage to modify the display device of Hattori et al. to make a display where a voltage is applied that is equal to or higher than a critical voltage of OCB mode liquid crystal for a predetermined time and thereafter a voltage lower than the critical voltage of the OCB mode liquid crystal for a predetermined time in order to transfer the liquid crystal layer to a splay orientation in order to complete faster transition between splay and bend orientation to reduce afterimage (as best understood).

6. Claims 3, 4, 6, and 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hattori et al.** (US Pub. 2001/0020925) in view of **Shi et al.** (US Pub. 2003/0053017) and in further view of **Ohta et al.** (US Pub. 2002/0149549).

Claim 8 is rejected the same as claim 1 above except:

Hattori et al. (as modified by Shi et al.) does not explicitly teach a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage higher than a voltage at which substantially black is displayed on a display face.

Ohta et al. teaches a display device where predetermined voltage is applied in order to have black and white display to the pixels (figs. 12, 15, 16, [0010], [0015]).

Therefore, it is obvious to one skill in the art at the time of the invention was made to use the idea of applying a predetermine voltage to get black and white display of Ohta et al. into the display apparatus of Hattori et al. (as modified by Shi et al.) to make a liquid crystal display apparatus wherein the driver applies a voltage higher than a voltage at which substantially black is displayed on a display face and equal to or lower than a maximum voltage which can be applied to the liquid crystal layer, to each of pixels of the liquid crystal layer for predetermined time instead of applying the predetermined voltage to each of the pixels and after the elapse of the predetermined time, applies a voltage at which substantially black is displayed on the display face, after the voltage at which substantially black is displayed on the display face is applied, applies a voltage at which substantially white is displayed on the display face as said voltage lower than the critical voltage of OCB mode liquid crystal (as best understood).

Claim 3 is rejected the same as claim 1 above, except:

Ohta et al. teaches a liquid crystal display apparatus wherein the predetermined voltage is a voltage at which substantially black is displayed on a display face (figs. 12, 15, 16, [0010], [0015]) (as best understood).

Claim 4 is rejected the same as claim 1 above, except:

Ohta et al. teaches a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage at which substantially black is displayed on a display face to each of pixels of the liquid crystal layer and then, applies a voltage at which substantially white is displayed on the display face, and then stops the supply of power to the driver from the liquid-crystal driving power supply (figs. 12, 15, 16, [0010], [0015]) (as best understood).

Claim 6 is rejected the same as claim 1 above, except:

Ohta et al. teaches a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver applies a voltage higher than a voltage at which substantially black is displayed on a display face, to each of pixels of the liquid crystal layer for predetermined time instead of applying the predetermined voltage to each of the pixels and after the elapse of the predetermined time, applies a voltage at which substantially white is displayed on the display face to each of the pixels, and then stops the supply of power to the driver from the liquid-crystal driving power supply (figs. 12, 15, 16, [0010], [0015]) (as best understood).

As to claims 9-12, Ohta et al. teaches a liquid crystal display apparatus wherein

a pixel electrode to which an individual voltage is applied with respect to each pixel (fig. 2, [0086] - [0089]) and an opposed electrode arranged opposite to each pixel electrode are disposed on the liquid crystal layer (fig. 3, [0086] - [0089]).

the voltage at which substantially white is displayed on the display face represents that a voltage between the opposed electrode and the pixel electrode, and a voltage between a gate line and the pixel electrode or a voltage between the pixel electrode and an electrode other than the pixel electrode are substantially zero (figs. 12, 15, 16, [0010], [0015]).

As to claims 13-15, Ohta et al. teaches a liquid crystal display apparatus comprising: a backlight connected to the liquid-crystal driving power supply to irradiate the liquid crystal layer, wherein when an off signal is output from the switch, irradiation from the backlight is stopped simultaneously when or before a predetermined voltage is applied to each of pixels of the liquid crystal layer from the driver (figs. 12, 15, 16, [0010], [0015]).

7. Claims 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hattori et al.** (US Pub. 2001/0020925) in view of **Shi et al.** (US Pub. 2003/0053017) and in further view of **Yamakita et al.** (US Pub. 2002/0145579).

As to claim 20, Hattori et al. (as modified by Shi et al.) discloses a liquid crystal display apparatus wherein the liquid crystal layer is provided with a pixel electrode which is connected to the driver and to which a pixel voltage is supplied and a specific electrode which is connected to the driver, to which a voltage different from the pixel voltage is supplied (figs. 3, 6, [0086] in Hattori et al.), and

which is disposed via a dielectric so as to be opposed to the pixel electrode, the pixel electrode is disposed so that at least a part of the contour of the pixel electrode is not vertical to the oriented direction of the OCB mode liquid crystal (fig. 7, [0017] in Hattori et al.).

Hattori et al. (as modified by Shi et al.) does not explicitly teach a display device where the driver generates an electric field in a direction different from the oriented direction of the OCB mode liquid crystal.

Yamakita et al. teaches a display device where the driver generates an electric field in a direction different from the oriented direction of the OCB mode liquid crystal ([0036]).

Therefore, it is obvious to one skill in the art at the time of the invention was made to combine the display device of Yamakita et al. with the display apparatus of Hattori et al. (as modified by Shi et al.) to make a liquid crystal display apparatus wherein when an off signal is output from the switch, the driver generates an electric field in a direction different from the oriented direction of the OCB mode liquid crystal between the pixel electrode and the specific electrode and after the elapse of predetermined time, supplying of power to the driver from the liquid-crystal driving

power supply is stopped (as best understood).

As to claim 21, Yamakita et al. teaches a liquid crystal display apparatus wherein the contour of the pixel electrode includes a first portion which generates an electric field not vertical to the oriented direction of the OCB mode liquid crystal but in a direction of twisting a part of the oriented-directional liquid crystal in one direction in a pixel and a second portion which generates an electric field in a direction of twisting another part of the oriented-directional liquid crystal in other direction ([0036]) (as best understood).

As to claim 22, Yamakita et al. teaches a liquid crystal display apparatus according to claim 21, wherein the first portion and the second portion are substantially parallel with the oriented direction of the OCB mode liquid crystal and alternately continuously formed ([0036]) (as best understood).

As to claim 23, it is obvious for the liquid crystal display device of Hattori et al. (as modified by Shi et al. and Yamakita et al.) to have an opposed electrode arranged opposite to each of the pixel electrodes is further disposed on the liquid crystal layer, when an off signal is output from the switch, the driver applies a voltage for substantially white display on a display face, between each of the pixel electrodes of the liquid crystal layer and the opposed electrode, thereafter, stops the supply of power to the driver from the liquid-crystal driving power supply (as best understood).

As to claim 24, it is obvious for the liquid crystal display device of Hattori et al. (as modified by Shi et al. and Yamakita et al.) when an off signal is output from the switch, the driver applies a predetermined voltage equal to or higher than a critical voltage of the OCB mode liquid crystal but equal to or lower than the maximum voltage which can be applied to the liquid crystal layer to each of pixels of the liquid crystal layer, thereafter, applies a voltage for substantially white display on a display face, thereafter stops the supply of power to the driver from the liquid-crystal driving power supply (as best understood).

As to claim 25, Yamakita et al. teaches a liquid crystal display apparatus wherein an electric field in a direction different from the oriented direction of the OCB mode liquid crystal is applied simultaneously when or after the voltage for white display on the display face is applied ([0036]) (as best understood).

As to claim 26, Yamakita et al. discloses a liquid crystal display apparatus wherein two pixel electrodes adjacent in the oriented direction of the OCB liquid crystal mode are arranged on the specific electrode via a dielectric, and contours of the two pixel electrodes are arranged so that they are not vertical to the oriented direction of the OCB mode liquid crystal and include a first portion of generating an electric field in a direction of twisting a part of the oriented-directional liquid crystal in one direction in a pixel and a second portion of generating an electric field in a direction of twisting

another part of the oriented-directional liquid crystal in other direction ([0036]) (as best understood).

As to claim 27, Yamakita et al. teaches a liquid crystal display apparatus wherein the driver applies voltages having phases opposite to each other to the two pixel electrodes (fig. 7, [0006]) (as best understood).

Response to Arguments

8. Applicant's arguments with respect to claims 1, 3, 4, 6, 8-15, and 17-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AFROZA Y. CHOWDHURY whose telephone number is (571)270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
5/6/2009

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